

169 MHz – Wireless M-Bus

Long range radio for AMR applications



- True narrowband with very good sensitivity and selectivity
- Integrated 500mW high power output in small form factor
- Slave, Master and Repeater integrated in one module
- Complete wireless M-Bus stack embedded
- Compliant with the new prEN13757-4* (when released)

Wireless
M-Bus

Radiocrafts was the first company to release a complete two-way 868MHz radio module fully compliant with the EN13757-4 and the OMS (Germany) together with the DSMR (The Netherlands). The experience from working with the Wireless M-Bus standard for several years has given Radiocrafts a unique position in the European metering market for RF communication. Radiocrafts is participating in the standardization work in the German OMS group, the European CEN TC294 workgroups, and is taking an active role in how the Wireless M-Bus is used in Automatic Meter Reading in Europe. With the release of the 169MHz narrowband Wireless M-Bus radio module, Radiocrafts is once again taking the lead by using advanced RF communication for Smart Metering in Europe and the rest of the world.

RC1700-MBUS4 radio module with embedded Wireless M-Bus protocol

The module has embedded Wireless M-Bus protocol compliant with prEN13757-4:2011, and is CE marked. The RC1700-MBUS modules are easy to use and will significantly reduce time-to-market for new metering products which shall comply with the new prEN13757-4:2011 mode N operating at 169 MHz. The time-critical protocol for two way communication is handled within the module, and the module provides extensive application layer support like message buffering and encryption.

RC1700-MBUS4

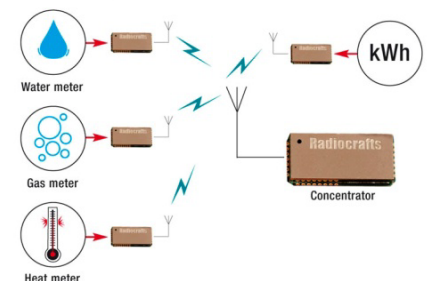
Wireless M-Bus prEN 13757-4:2011
 Supports N mode, Narrowband
 Auto-message generator and encryption embedded
 25 mW output power

RC1700MP-MBUS4

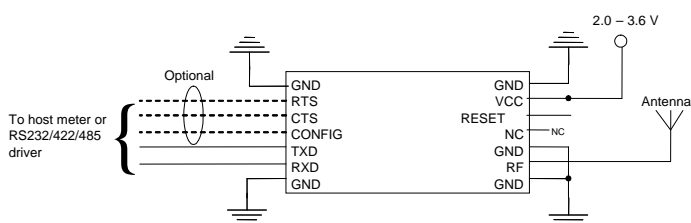
Integrated power amplifier, 250 mW

RC1700HP-MBUS4

Integrated power amplifier, 500 mW at 5V supply



UART interface: Data in – RF out



The RC1700-MBUS module has an easy to use UART interface (easily translates to RS232/RS422/RS485/USB). This is a standard interface which enables customers to use an existing external microcontroller to work with the radio module. We have experienced customers who have made a complete Wireless M-Bus compliant meter in less than 3 weeks.

2 pins for data, 2 pins for power and 1 pin for antenna!

N-Mode in the EN13757-4

The new N mode has been specified in the pr13757-4 (2011) which is on enquiry. The new mode is optimized for long range AMR and battery operated meters.

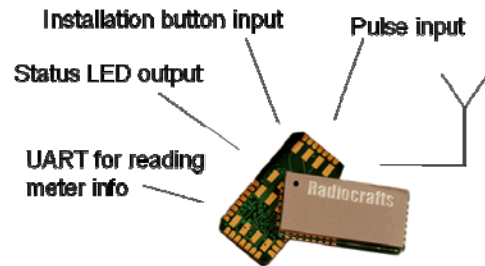
Harmonized frequency band in EU and EEA
 Reserved for AMR and Asset tracking CEPT 70-03
 Optimized protocol for battery operated devices

- True Narrowband with 12,5 KHz
- New compact Extended Link Layer
- New compressed Application Layer
- NRZ coding over the air
- AES128-CTR – Encryption with counter mode
- GFSK, GMSK and 4GMSK modulation options
- Repeater

RC1700-MBUS Customer specific Feature set

Based on the standard feature set Radiocrafts also offers customer specific feature sets. Features in addition to MBUS4 might include, but are not limited to:

- Reading of pulse input
- Storing main index
- Reading meter data via serial interface
- Handling application layer of wireless M-Bus standard.
- Tampering alarm
- Low Battery alarm
- Accurate event timing with internal RTC
- Installation
- Wired M-Bus link protocol



High Speed Flashing and Testing

Radiocrafts has implemented a unique solution for high speed volume production. This is an innovative test system for high volume flashing, RF testing and taping of radio modules. This machine combines all our experience and expertise in radio module test and have the capacity of testing more than 10k modules per day.

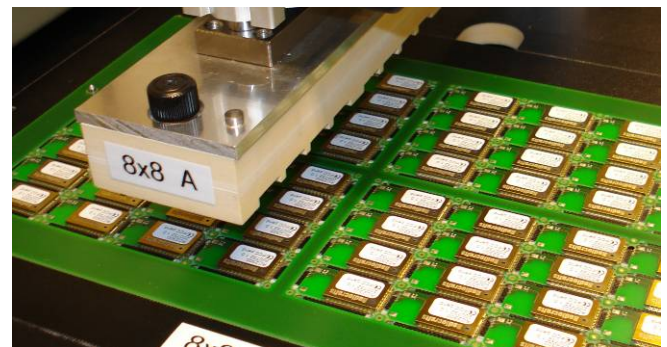
Radiocrafts is testing the following parameters on the RC1700-MBUS radio module before shipping:

- Freq accuracy (ppm)
- Output power (dBm)
- 2nd harmonic (dBm)
- 3rd harmonic (dBm)
- Spurious emission (freq/max level, dBm)
- RX sensitivity
- TX supply current (mA)
- RX supply current (mA)
- Idle supply current (mA)
- Sleep supply current (uA)
- Program memory verification
- UART communication

Testing of all these parameters will make further detailed testing unnecessary, and only functional testing needs to be done to ensure that the total application is working properly.

Spurious measurements – important vs CE qualification

We have experienced customers and competition which are making radio solutions with unknown compliance status versus CE regulations. This is often based on a lack of knowledge about the different CE regulations and not enough control of process variation. We know by experience it is difficult to confirm to regulations with certain chips and SoC's. This is one of the reasons why we ALWAYS test our radio modules 100% before shipping to customers.



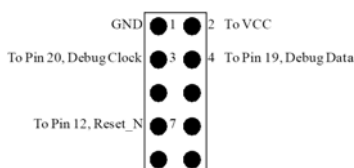
Radiocrafts ATS – Automatic Test Station – module boards

Benefits of 100% test coverage:

- Little or no variations on delivered product
- Statistical process control
- Avoid yield problems, and costs
- Ensure regulations compliancy for every radio module
- No extensive testing needed at later stage

RC1700-MBUS Firmware upgrade option

[AN012 firmware upgrading the rc1180 mbus module 1_0](#)



Radiocrafts can now offer customers who have purchased the RC1700-MBUS Demo Kit the option to upgrade the firmware of the module, in order to be updated on the latest developments from Radiocrafts.

The RC1700-MBUS Demo Boards include an on board firmware upgrade connector compatible with the flash programming adapter from Elprotronic. Existing customers using the RC1180-MBUS series can use the same programming unit. The application note describes how to firmware upgrade RC1700-MBUS Demo Boards using the FlashPro-CC tool. Please go to www.elprotronic.com for purchasing information and software download.



FlashPro-CC connected to RC1180DB-USB